ASTE

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O. B. JONES, Editor

Owing to the nature of the American Society of Tool Engineers organization, it cannot be responsible for statements appearing in the Journal either as advertisements or in papers presented at its meetings or the discussions of such papers printed herein.

Address all editorial matter, advertisements, and inquiries to A.S.T.E. Journal, 8203 Woodward Avenue, Madison 5048.

OUR PRESIDENT'S MESSAGE

WILLIAM H. SMILA

HISTORY AND PURPOSE OF THE A.S.T.E

THE A.S.T.E is the outgrowth of a society formed by the students of the Detroit College of Applied Science for the study of problems confronting the tool designer, tool engineer, master mechanic, factory manager and others connected with mass production. This original society decided that by adding men experienced along this line to the membership roll a bigger and better society could be formed for the edification of both the novice and the "old timer."

As soon as members from the principal manufacturing plants of Detroit and vicinity were enrolled, plans were made to incorporate the society as a non-profit corporation under the laws of Michigan. An attorney working in conjunction with the By-Laws Committee drafted the by-laws and applied for a charter. At the time the charter was closed our society had a membership of 187. This society was incorporated under the name of the American Society of Tool Engineers. Thirty-three directors were chosen from the membership and these directors elected officers as follows: J. A. Siegel, President; W. H. Smila, 1st Vice President; Earl Ruggles, 2nd Vice President; A. M. Sargent, Secretary; and Wm. J. Fors, Treasurer. These officers served the society during its first year, and during this time our membership steadily grew unetil we had approximately 500 members.

The society, from the time of its formation, has held monthly meetings at which speakers of our foremost industries have spoken and shown movies of the phases of their business which were of interest to the members of our society. Our first two or three meetings were held at Webster Hall, but since that time all our meetings, with one exception, have been held at the Detroit-Leland Hotel. This hotel, due to its central location, and facilities for accommodating large gatherings is an ideal meeting place. These monthly meetings develop the social side of our society by strengthening old friendships and forming new ones.

The social side is one of the main purposes of our society, but the professional or technical side is of still greater importance. Our aim is to develop more fully our members so as to make them more efficient in their daily work and to give them an insight into the other fellow's problems and his solution of same.

Almost daily some member is asked if our society is planning to become a union. To this question there is but one answer and it is emphatically NO. This society was not formed for the purpose of dictating or even discussing any policies or codes regarding wages, hours, conditions, and so on. The society's policy is to be helpful, if possible, and not detrimental to any employer. There is, however, an organization with a name somewhat similar to ours being formed in the city of Detroit, the purpose of which is to form a draftsmen's and designer's union, but it should be thoroughly understood that the American Society of Tool Engineers is in no way connected with this society.

COMMITTEES

A. M. SARGENT

THE committee having the outstanding results during the last 30 days has been the Industrial Relations Committee. This committee has been responsible either directly or indirectly in employment of a considerable number of our unemployed members. Today, the Secretary's Office is receiving practically no further applications for employment, although occasionally there is an opportunity to refer individuals to possible opportunities for positions. We believe that this Committee is doing a tremendous amount of good.

The Standards Committee has held two meetings during the past 30 days which have been very productive, in that definite methods have been worked out under which the Committee proposes to operate. The following resolution has been approved by the Board of Directors and the Standards Committee Chairmen, and we believe it is self-explanatory. Definite progress is being made in accordance with this resolution:

Resolved—

> "That the chairmen of each committee respectively make effort to collect and compile in workable form all data and established standards, information, etc.,

now or hereafter available by manufacturers, other engineering societies, committees, etc., relating to the scope of their respective committees and of general interest to the membership of the Society when compiled in reference book form."

Due to the fact that the July meeting was omitted, the Meetings Committee is supposed to be having a vacation. However, according to the best information that can be obtained, this Committee is taking advantage of its opportunity and is preparing some programs to be presented in the next few months which will be of vital interest to all members. If the reports of these meetings are substantiated by the meetings themselves, every member will have spent his time well in attending.

The various other committees have not been particularly active since the last publication, due to the fact that their work is very well in hand until the autumn months.

A Special Nominating Committee, under the chairmanship of Mr. B. L. Diamond, has recently held meetings to nominate a new Board of Directors which will take office in October. While these committee meetings were secret sessions it is rumored that they are proposing some very active members to be voted on as directors, and the general membership will receive their ballots within a few weeks. It is hoped that every member will interest himself vitally in this particular detail.

THURSDAY, AUGUST 10, 1933, EIGHT O'CLOCK
AT DETROIT SOCIALER TURNVEREIN
EAST JEFFERSON AVENUE OPPOSITE MEMORIAL PARK
SPEAKER: FROM DETROIT BOARD OF COMMERCE SUBJECT: THE NRA PROGRAM

IN accepting the most kind invitation of the Detroit Socialer Turnverein Society to hold our August meeting in their club building, we urge all members of the A.S.T.E. to be present and extend an invitation to their engineering friends.

A most interesting program has been arranged, including a prominent speaker, who will talk on a subject of great interest at the present time, the NRA program. There will also be music and high class vaudeville entertainment.

A light lunch will be served to those who desire it.

There was no July A.S.T.E. meeting, hence we have no last meeting report to submit.

SEPTEMBER MEETING

THURSDAY, SEPTEMBER 14, EIGHT O'CLOCK AT DETROIT-LELAND HOTEL

A BIG engineering meeting is being planned for September 14th. The subject for the evening will be Welded Steel Dies, Fixtures, and Machines. Speakers and equipment for demonstrations will be furnished by Whitehead and Kales Manufacturing Company, Weldit Acetylene Company, and Westinghouse Electric and Manufacturing Company.

A dinner will precede the meeting. See the September issue of the Journal for full particulars.

PROBLEM STUDY

Wednesday, August 16, 8:00 P.M.
Detroit College of Applied Science
8203 Woodward Avenue

This meeting will be devoted to the discussion of mathematical problems that come up in the work of A.S.T.E. members. Anyone who has problems to be worked, or problems he believes would be of interest to others, is urged to bring them in.

JUNIOR'S NIGHT

Thursday, September 28, 8:00 P.M.
Detroit College of Applied Science
8203 Woodward Avenue

Speaker: Mr. Harry Trevelyan.

Subject: Gages, Their Design and History.

There will be no August Junior Meeting.

TECHNICAL

JOHN M. CHRISTMAN RAYMOND J. WALTER W. J. McKEEN

STRENGTH OF MATERIALS

By J. M. CHRISTMAN

IN the previous issues of this Journal we have been dealing with stress in beams. The examples used so far have been beams fixed at one end and free at the other, and having the weight producing the stress suspended from the free end. Tables have been given to find the stresses so produced.

It is the purpose of this article to explain the derivation of these tables as simply as possible.

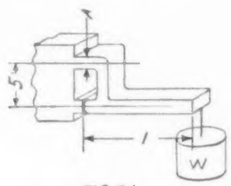


FIG #1

Consider Fig. 1. This is an arm or beam held in position by fiber A. To produce a stress of one pound in fiber A, W must be 1 × .5 = .5 lb.

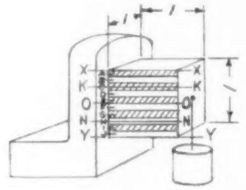


FIG #2

Fig. 2 is a beam fixed at one end with a weight swung from its free end. This beam is divided into ten equal sections as shown, each section .1" deep. The neutral fiber lies along line 0-0. The maximum stress will be in the outermost fibers along lines X- Xand Y-Y.

The lines K-K and N-N lie half way between the neutral axis 0-0 and their outermost fibers. The stress along these lines will be half as great as at the outermost fibers. Similarly, the stress along any fiber will be proportional to its distance from the neutral axis.

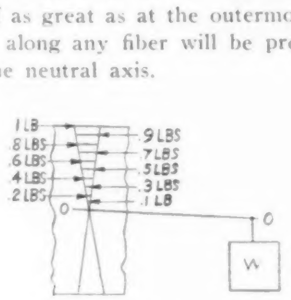


FIG # 3

Fig. 3 shows a section of the beam from the neutral axis to the outermost fibre being divided into ten equal parts. Considering the dividing lines as fibers and the weight as sufficient to produce a stress of one pound in the outermost fiber, the stresses in the rest are as shown in Fig. 4. These values will be represented by Y. Being on the upper side of the neutral axis these stresses are tensile. Below the neutral axis the corresponding values will be the same, but the stresses will be comprehensive.

SECTION	AREA	L.H.	Y		WEIGHT
A	X .1	X .45	X .9	=	.0405
B	X .1	X .35	X .7	=	.0245
C	X .1	X .25	X .5	=	.0125
D	X .1	X .15	X .3	=	.0045
E	X .1	X .05	X .1	=	.0005
F	X .1	X .05	X .1	=	.0005
G	X .1	X .15	X .3	=	.0045
H	X .1	X .25	X .5	=	.0125
I	X .1	X .85	X .7	=	.0245
J	X .1	X .45	X .9	=	.0405
			TOTAL	=	.1650

FIG #4

Fig. 4 shows the average stress for each section of the beam shown in Fig. 2. The letters will be seen to correspond with the sections. As the sections are .1" thick by one inch wide, their areas will be .1 square inch each as shown. L.H. is the product of the length of the beam and the distance of the center fiber of the section from the neutral axis. (See Fig. 1.) Y is the stress in pounds along this fiber, which is taken as the average for the section. The total of the weights necessary to produce these stresses is found to be .165 lb., or about 1/6 lb. It will be remembered that the stress in the outermost fiber was one pound per square inch.

Referring to the article on Strength of Materials in the July issue of the Journal, we find 1/6 to be the section modulus for rectangular sections, when the other dimensions are at unity.

Well Known Master Mechanic Succumbs

Alfred C. Sayre, master mechanic of the Dodge plants of the Chrysler Corporation, died July 30 at the Grace Hospital in Detroit as the result of an operation for appendicitis, at the age of forty-nine.

Mr. Sayre was born in Norfolk County, England in 1884. In his youth he learned the machinist's trade as an apprentice in the plant of Crabtree & Company, Spawich, England, manufacturers of marine engines. He did tool and die making in England from 1906 until 1908, when he came to America. He served as tool and die maker and later as foreman of the machine repair department of the Buick Motor Company of Flint, Michigan, from 1908 to 1913. From 1913 to 1915 he was tool room foreman and master mechanic for the Grant Lees Gear Company of Cleveland, Ohio.

From 1915 up to the time of his death, Mr. Sayre had been connected with the Dodge Brothers Corporation. Up to the time of his appointment to the position of master mechanic, seven years ago, he had served principally in the Plant Layout and Methods and Equipment departments.

Mr. Sayre was a charter member of the American Society of Tool Engineers and a member of the Masonic order at Flint, Michigan.

The funeral was from the Northrop Funeral Home and the burial in Greenlawn Cemetery, Wednesday, August 2 at 2:00 p.m.

Mr. Sayre is survived by his wife and daughter who reside at 16737 Trinity Avenue, Redford, Michigan.

NEW TOOLS AND PROCESSES

B. L. DIAMOND HAROLD GILLER

SHOCK ABSORBERS FOR AIR CYLINDERS

By B. L. DIAMOND

THIS device was designed to cushion the blow on the fixture by a long stroke air cylinder piston.

Large valves and piping were used to insure quick action and cut down time of operation. The result was a destructive trip hammer blow to the clamps and part

The remedy was a shock absorber on the principle of the one shown in the accompanying sketch, Fig. 1. The action is as follows: A piston is held at one end of a cylinder by a compression spring. The whole chamber is filled with oil. The rapidly approaching clamp contacts the piston rod of the shock absorber forcing it back and forcing the oil in the cylinder from one end, through the small orifice, to the opposite end of the cylinder. The size of the orifice determines the amount the clamp is slowed down. When the clamp is released the large spring absorber out, the ball check releases, tends to push the piston of the shock and the oil flows rapidly to the spring end of the piston, ready for the next cycle.

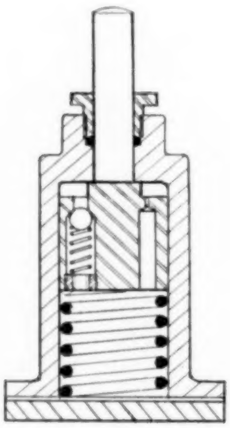


Fig. 1

Fig. 2 shows an example of how the shock absorber can be applied. It can be readily seen that this device can be applied

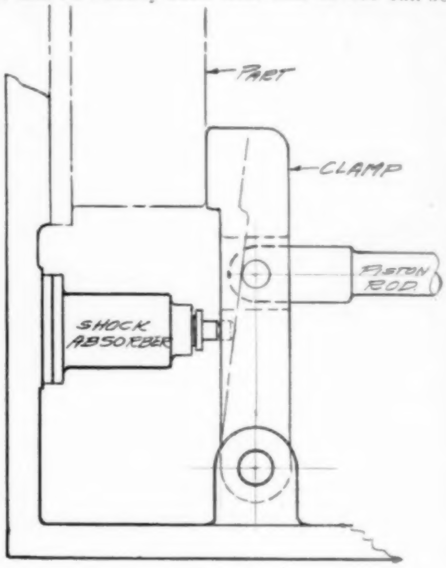


Fig. 2

to anything that is being moved by an air cylinder to cushion the end of the stroke or any part of the stroke, by means of by-passes and valves to suit conditions.

NEW DIES

E. W. SLOCUM

LAMINATION DIE COSTS

FOR the past two years a 50-ton Henry and Wright dieing machine has been used in the manufacture of electric motors used on vacuum cleaners. The machine has demonstrated a great productive capacity and a very low cost per thousand impressions.

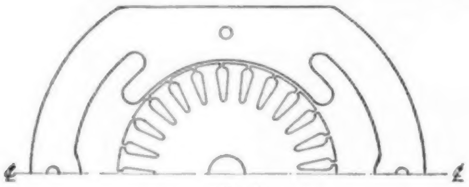


Fig. 1

Rotors and stators for the motors are built up with laminations punched from 24-gage electric sheet steel. Fig. 1 shows one of these laminations. The sheets used are purchased in ten-foot lengths and are run through a power slitter which cuts the sheet into strips five inches wide. In going through the slitter the sheets pass under a felt roll saturated with a 50-50 mixture of waste machine oil and coal oil which is deposited as a film over the entire sheet, serving as a lubricant for punching. Strips from the slitter are placed on a small truck with an elevated bed and pushed to the press. The operator or helper loads the feeding table from the truck.

The Henry and Wright machine is operated by one man and a helper. The operator feeds the machine, makes die changes, adjusts the double-roll feeder and keeps the machine in production. The helper takes away the finished product and the scrap. The operator stands slightly to one side of the machine on an elevated platform and feeds the strips into the roll feed. The feeder on the one opposite side pulls the blanked strip away from the die. Finished pieces fall into two troughs and scrap is caught in a box at the base of the machine.

The dieing machine is belted to a line shaft and operates normally at 125 strokes per minute. On the basis of the average hourly production possible—5500 pieces each of stator and rotor—the effective efficiency of the press is 73 per cent. Under normal conditions of continuous feed with ample stock the operator will not average more than two lost strokes between strips.

Dies are all of the progressive type doing four operations on the strip at each effective stroke of the machine. The first two operations blank out and remove the rotor, and the next two blank and remove the stator. This type of die was originated by the company manufacturing the motor several years ago. Figure 2 illustrates the four operations.

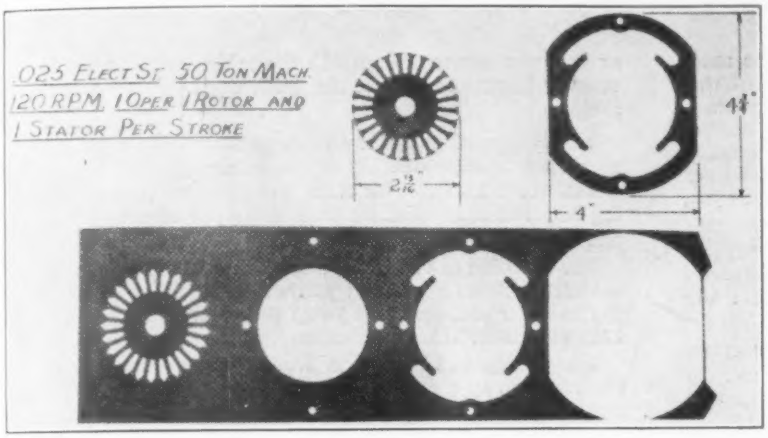


Fig. 2

Dies used on these presses are made of high-speed tool steel. All are standardized and are interchangeable between rhw Henry and Wright and the No. 5, 68-ton press doing the same class of work. The used on the piece illustrated is 7 x 17 inches and is worked up to a slip fit, with .001" to .002" clearance.

At the normal rate of production and under conditions of usual operation the dies are reground after an average of 60,000 strokes.

The table below shows the operating costs of the Henry and Wright machine under the above conditions.

DIEING COST ON MOTOR LAMINATIONS

Machine cost			
Investment—$3,450.00 plus $125.00 installation allowance			
Depreciation—$3,575.00 ÷ 10-year life		$ 357.50	
*Average interest @ 6%—11/10×$3,575×.06/2		117.98	
Maintenance and repair allowance		50.00	
Floor space—74 sq. ft. @ $ .17		12.58	
Total fixed machine charge			$ 538.06
Die cost			
2 sets @ $1,000.00—1 year life		$2,000.00	
*Interest @ 6%		120.00	
Regrinding cost—226 @ $3.50		791.00	
Total annual die cost			$2,911.00
Daily dieing cost			
Daily machine cost—$538.06÷260 days	$ 2.07		
Daily die cost—$2,911.00÷260 days	11.20	$ 13.27	
Lubrication—1 pt. oil @ $ .18/gal.		.02	
Power—Estimated—31 kw. @ $ .02		.02	
Labor—1 operator @ $ .75×9.5 hr.	$ 7.15		
1 helper @ $ .52×9.5 hr.	4.94	12.07	
Daily die cost		$ 25.98	
Hourly dieing cost—(9.5 hr.)			$ 2.73
Unit dieing cost			
Production per hr.—5500 rotor and statar pieces cost per M—$2.73÷5.5 (M)			$ .496
Die cost			
Hourly die cost—$2,911.00÷(9.5 hr.×260 days)		$ 1.178	
Die cost per M rotor and stator pieces			$ .214
Efficiency			
125 strokes per minute—7500 per hour			
Efficiency—5500÷7500			73%

*Allowing for interest earned by depreciation reserve.

NEW MACHINES

HAROLD GILLER B. L. DIAMOND

THE HEALD No. 48 BORE-MATIC

THE Heald No. 48 Bore-Matic has been designed to meet the rapidly-growing demand for a small machine of this type, capable of handling a variety of work economically, yet having all the automatic features customarily associated with the Heald "Bore-Matic." In addition to small shops, it is expected to find a field in high production lines where it is desired to keep one machine set up for each job, instead of using a multiple set-up on a larger machine.

This new small machine is simple and compact, yet rugged. It is entirely automatic in operation, requiring no manipulation by the operator except to unload, load and start the machine.

The base is a heavy semi-steel casting of box section, with carefully designed and properly placed ribbing to give the maximum rigidity and freedom from vibration, and three-point contact on the floor to prevent distortion.

The table is a heavy, well ribbed casting supported on one flat and one V way and provided with gravity pressure lubrication from the hydraulic system. Lubrication is positive and automatic. The table is hydraulically operated on the boring stroke and returned by a gravity mechanism. There is ample room for locating fixtures on a finished pad 9" wide x 22" long on top of the table, having two T slots running longitudinally through it. A removable hand crank acting on a screw underneath the table assists in setting up, making it possible to set the table dogs quickly and accurately.

The bridge of the No. 48 is narrower than on the larger machines, accommodating a maximum of only two boring heads. It is also shorter from left to right, so that the boring heads used are shorter than the types used on the No. 46 and No. 47.

The machine is driven by a single 1800 RPM motor direct-connected to a high duty hydraulic pump located low within the base. The motor and pump can easily be slid out of the base as a unit, after disconnecting two pipes.

The boring head drive is from the opposite end of the motor shaft, by means of multiple V belts, as with our other machines. With the various pulleys which can be used this motor gives a speed range to the boring heads of 625 to 3600 RPM. When lower speeds are desired, a 1200 RPM motor can be specifically fitted, with a hydraulic pump of larger capacity, to give a speed range of 425 to 2400 RPM.

Coolant can be provided on the work, where desired, from a separate, self-contained, motor-driven pump and tank unit. The coolant and boring chips are conducted away from the machine as rapidly as they drain from the table, to the tank unit, which is easily cleaned out when necessary, without disturbing the machine proper.

Three sizes of boring heads are available and of the Red Head construction which is proving so successful on the grinding machines as well as the larger Bore-Matics.

Maximum and minimum centre distances between heads of the standard type when two are mounted on the bridge are 10" and 5-3/16" respectively.

The control box consists, in addition to the stop and start mechanism, of two practically identical units which control respectively the boring and facing feeds. They can also be used for two different boring operations. If necessary, a third unit can be added, to give a third cutting feed to the table. Boring and facing feeds are controlled by the knurled knobs which project from the front of the control box.

The boring spindles are always free to turn when not being driven; an extremely valuable feature in setting up. The crank makes it possible to set the dogs which control the boring stroke quickly and accurately. This convenience of set-up makes the machine ideal for short jobs, without sacrificing any of the features which make Heald Bore-Matics so highly productive.

By moving the start and stop lever on the right hand end of machine to the left, the motor will be started and the table start on the "in" stroke at rapid traverse. The table will continue at rapid traverse until the boring cam strikes the boring feed lever which projects from the top of the control box. This slows down the table according to the setting of the "Boring Feed" knob. The table continues at boring speed until the facing cam strikes the facing feed lever. This reduces the table feed still further, under the control of the "Facing Feed" knob. The screw in the stop dog then strikes a lever that snaps down and cuts off the power to the motor, at the same time braking the motor and boring heads by means of the back pressure against the pump. The table has a dwell at the extreme "in" position to give the spindles time to stop before the table starts back to its loading position.

OPERATION PLANNING

F. L. HOFFMAN

Mr. Hoffman reports that he is still distressingly busy, so that he has not yet been able to get down to the task of writing another installment on his continued article on Operation planning.

We therefore must apologize to our readers once more for not being able to present any material in this section at the present time. We hope, however, to get Mr. Hoffman's belated installment for the September issue.

NEWS OF INDUSTRY

E. R. DeLUIZ

A new Franklin Olympic was introduced today as the second edition of the air-cooled model with which Franklin late last year entered the medium priced field. Prices of the three types remain unchanged. The sedan lists at $1385; coupe, $1385; and convertible coupe, $1500.

Production of passenger and commercial cars by member companies of the N.A.C.C. during June totaled 195,178 units. This is an increase of 104% over June, 1932, and a gain of 13.2% over May this year.

Sales to distributors and dealers of Chrysler Motors for the first six months of 1933 almost equaled the total sales for the entire year of 1932, it was announced recently.

Definite proof that an era of improved business is dawning was given by Roy D. Chapin, president of the Hudson Motor Car Company, recently.

"There is every indication that the second half of the year will be better than the first," said Mr. Chapin. "No more bank holidays will occur to interrupt our advance and the fundamental conditions that control business are better. There is a greatly improved spirit among people which will encourage their buying. We are in for a good summer and a good fall."

June exports of Studebaker, Indiana and White trucks and buses set a new record for twenty-two months, and the export shipments of Studebaker and Rockne passenger cars exceeded May of this year and surpassed June of last year, Arvid L. Frank, vice president and general manager of the Studebaker Pierce-Arrow Export Corporation, reports.

Studebaker's losses stopped during the second quarter under receivership operations, with the net operating profits realized in April, May and June. Studebaker's cash balance on June 30 was about $1,100,000 larger than on March31.

The Plymouth Motor Corporation has the largest July advertising campaign in its history. While daily newspapers will be the basic media, magazines, radio and outdoor advertising will also be utilized. Outdoor advertising is appearing in 2,000 towns, while radio is confined to spot broadcasting of electrical transcriptions.

Technical aspects of the utilization of alcohol-gasoline blends as automotive fuels were given in a report recently by the special committee of the Cooperative Fuel Research.

Comparing gasoline and the proposed ten per cent alcohol mixture in the same gasoline, the following are established facts:

1. The public demands acceleration in its automobiles and the carburetors are set for this. For equal acceleration with the alcohol blend, consumption is approximately 4% higher than with straight gasoline.
2. Engine starting is more difficult with the alcohol blend.
3. The alcohol blend has a higher anti-knock value, but at a much higher cost per unit.
4. The tendency of alcohol to absorb moisture from the air, and the water which normally accumulates during storage and service is frequently sufficient to cause separation of the alcohol from the gasoline.
5. If alcohols were desirable for fuels for blending, the oil industry could produce it at less cost from petroleum than they can be produced from corn or other agricultural products.

Studebaker wound up the first six months of 1933 with the highest volume of June business since 1930, according to Paul G. Hoffman.

Despite the fact that the industry was idle over the holiday stretch, Automotive Daily News predicts that July production of cars and trucks should equal, if not exceed, the output of June. Even with one hand tied behind its back, so to speak, the industry should come mighty close to doubling the output of July, 1932, which was 118,613 units.

A.S.T.E. NEWS

LOLA CORBIN S. R. READ

Our old friend, "Bill" Fors, has recently moved from 1340 East Grand Blvd. to 7219 St. Paul. Undoubtedly some of you will wish to drop in and see him at his new residence.

Mr. Carl W. Horack, Associate in Mechanical Engineering, at the University of California, Berkeley, California, and family are motoring through the Central West this summer,

visiting relatives, attending the Century of Progress Exposition at Chicago, etc. Mr. Horack dropped in the office the other day to say "hello." Through conversation, we learned that he enjoys receiving our monthly journal and is very greatly interested in our endeavors and activities. As Mr. Horack was formerly a resident of Detroit, he took the opportunity of looking through the roster and found, as members, the names of several of his old acquaintances, and regretted that he did not have the time to visit them. Mr. Horack was disappointed to learn that there was to be no general meeting in July, as he had hoped to attend at least one of these meetings. We sincerely hope the next time he gets out this way, it will be possible for him to spend more time with us.

After spending about ten days at the Century of Progress Exposition, "Bill" Maier, of Haberkorn & Wood, is back on the job again looking "fit as a fiddle."

TIME STUDY METHODS

Waste is a loss to the world from which nobody receives a benefit.

(Continued from last issue)

THE proper analysis of an operation is in some cases a very simple matter, as is also the subsequent time-study, while again it may present a complicated problem. Much depends on the study that has been given the work in the tooling-up and laying-out process.

Sometimes the job has a make-shift lineup, due either to inadequate funds available for tools and proper machinery, or, as is quite often the case, when the term of the schedule is not long enough to warrant an expenditure of money that would not be amortized before the work was completed.

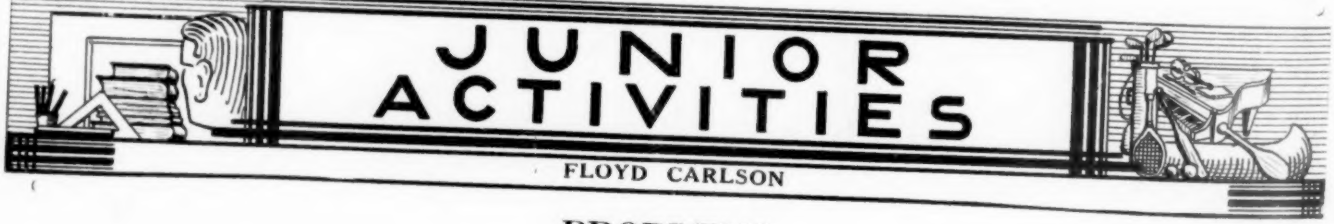
All else being equal, that is if the nature of the job and its schedule does not demand high production or if an expenditure for a high class tool-up should be barely amortized, then the work should be lined up in the manner which will give maximum employment to the workman. This does not imply that the job does not deserve real attention. It is surprising what intelligent operation analysis can accomplish with the tools at hand. An engineer may have available several different types of equipment, any one of which is capable of doing the job at hand. If he reaches into the bag and draws out the first one he touches, what happens? Sometimes it turns out all right, sometimes it doesn't. Many such jobs are set up and operated throughout the duration of the job without a complaint from anyone. The tool engineer may think he has done a good job. So does the management; they are dependent on him and on time-study to do the job right. If the time-study man fails to see what might have been accomplished, or fails to report it if he has seen it, management remains in ignorance of its loss.

The time-study man faces many situations in the shop which, for one reason or another, are beyond his control. He may have a wealth of knowledge of the proper feeds and speeds on machine work or of logical sequence of assembly operations, yet he is powerless to act other than to suggest changes. The machine may be of a single purpose type, left over from some previous job and without a proper gear range to lend itself to the work at hand which is probably a direct opposite of machining characteristics. A really suitable machine for the job may have been left standing idle among other surplus equipment. Many tool engineers in the past have been loath to correct such a condition as it reflects on their initial judgment. The same relative conditions are found in plant layout work. What layout engineer likes to see a time-study man appear with improvements on his work which he knows down in his heart are improvements which with a few moments additional thought, or rather forethought, on his part, would have been incorporated in his original scheme, with consequent material savings in labor and money expended. Neither he nor the tool engineer are willing to request additional appropriations to correct these mistakes, therefore they remain undone as long as time-study does not register a protest and production requirements are maintained.

The alternative to all this is cooperation between these departments with the result that tool and plant engineers became motion-minded. Through them this attitude gradually extends throughout the entire production personnel. Until this stage is reached improvements and economy will be sporadic, but after it is attained the organization will steadily progress until few improvements are thought of *after* production is started. Production costs will drop in a gratifying manner and less trouble and friction will be encountered at all stages of manufacture of a product.

Large industrial organizations are conducting compulsory courses of study for executives with the sole thought in mind that these chosen men may have a clearer insight into the workings of the other fellows job and a consequent co-operative development of mind which produces both harmony and economy. In other words they are motion-minded and working together to produce their work economically and correctly with the greatest possible elimination of waste in every phase of manufacture.

(Continued next issue)



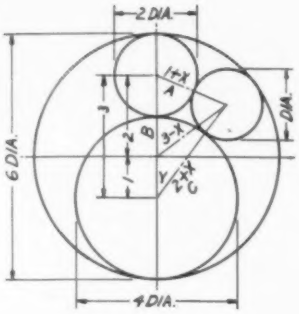
PROBLEMS

THE following formula, for calculating acme threads, was contributed by Mr. J. P. de Montigny.

$$X = A \div B \div \frac{C}{2} - D$$

$$A = E \times \text{Sin } F$$

$$B = K - \frac{H}{2} \times \text{Cot } G$$



C = Diameter to suit

D = Depth of thread

$E = \frac{C}{2}$ (diameter)

F = 14 ½°

G = 14 ½°

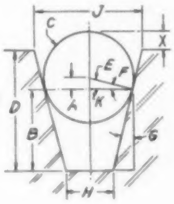
H = Width of thread at bottom

J = Width of thread at top

K = A Cos F

Here is the solution to one of the problems published in the July issue of the Journal. As for the other problem, no one has yet submitted a solution. Get busy, you mathematical geniuses of the A.S.T.E.!

Let × = radius of unknown circle.



$$\text{Cos } Y = \frac{b^2 \div c^2 - a^2}{2bc} \quad \text{(Cosine formula.)}$$

$$\text{Cos } Y = \frac{3^2 \div (\ \div \times)^2 - (1 \div \times)^2}{2 \times 3(2 \div \times)}$$

$$\text{Cos } Y = \frac{1^2 \div (2 \div \times)^2 - (3 - \times)^2}{2 \times 1(2 \div \times)}$$

$$\frac{3^2 \div (2 \div \times)^2 - (1 \div \times)^2}{2 \times 1(2 \div \times)} = \frac{1^2 \div (2 \div \times)^2 - (3 - \times)^2}{2 \times 3(2 \div \times)}$$

$2+ \div 12 = 30\times - 12$
$\times = 6/7''$; Diameter = 1.7143″

MEETINGS

The next meeting of the Junior members of the A.S.T.E., to be held September 28th, will feature Mr. Harry Trevelyan, who will speak on Gages, Their Design and History.

Mr. Trevelyan is at present working in the Tool Engineering Department of Packard Motor Car Company. In the past he has held positions with the Lincoln Motor Company, United States Ordinance Department, and the Studebaker Corporation, specializing chiefly in gage work.

The Junior meeting of July 27th, held at the Detroit College of Applied Science, was addressed by Mr. Earl A. Hutton, of the Centerlock Drill Bushing Company.

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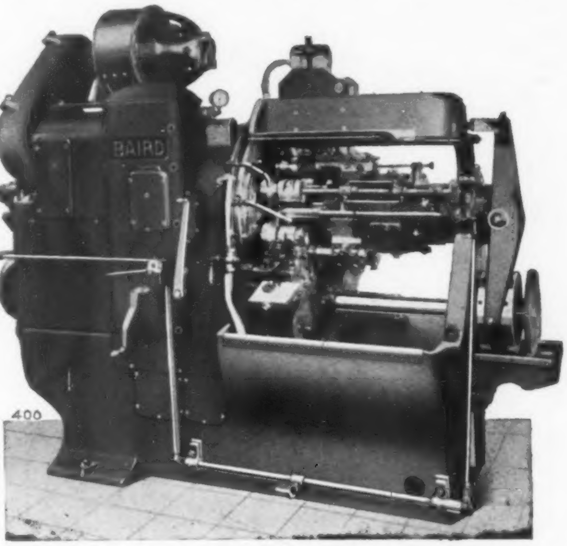

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